



**MD SERIES**

**Owners Manual  
and  
Installation  
Guide**



**merlin<sup>2</sup>**

# Congratulations

on your selection of a U.S.Amps MD series amplifier. We take pride in manufacturing our products and you can expect your new amplifier to give you years of trouble-free service.

To make your installation as easy and reliable as possible, please read this manual carefully before beginning.

If you need more information, your U.S.Amps Dealer will be glad to help.

## Milestone



1986	Founded in Gainesville, Florida, USA
1988	First "no negative feedback" amplifier First one-half ohm stable amplifier "Magnetic Loop Regulation"
1991	First dual-board amplifiers "Power amplifier strapping" Plexiglas panel
1992	"Vari-loud" tone filters First class "D" amplifier at the IASCA Finals
1995	Mirror-polished heat sink
1996	First dual-torroid master/slave MOSFET power supply
1997	XTERMINATOR
1998	"Smart Amp Technology"(SAT)
2000	TRUE DIGITAL full-range stereo performance
2001	Utilize the vacuum tube
2002	Takes a solid step into multi-channel amplifiers
2003	"Class DE" Digital Amplifiers
2005	New lines of products: Merlin2, IS, and AX-Series New facility in California, USA
2006	XTERMINATOR is BACK! Introducing "Multi-Link Technology"(MLT)
2007	Whole NEW design of Merlin2 series

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## Genuine Power

*U.S.Amps is a manufacturer of reliable, high-power quality car audio amplifiers and accessories.*

*What is your expectations?*

*U.S.Amps will meet your needs and provide you with genuine power and accurately reproduced sound.*

*No other company offers a wide range of high quality purpose-designed amplifiers as we do.*

*Discover the secret of car audio professionals and serious sound enthusiasts. For 21 years, U.S.Amps has defined the standard of amplifier quality and power. High performance listeners agree: the best systems are built on a rock solid foundation of U.S.Amps.*

*Designed and hand-crafted in our Florida Factory, U.S.Amps are the finest car amplifiers ever built. All U.S.Amps products are uniquely designed and carefully engineered to allow for maximum versatility and dependability.*

## FEATURES

### POWER SUPPLY

- High-current MOSFET devices
- MMT-regulated Power Supplies
- 35 nanosecond Switching Diodes
- High capacity Power Transformer
- Multiple Bypass Capacitors on incoming 12V supply
- Time Delay Turn-on with Opto-coupled Muting Circuits
- Power supplies use Pulse-width Modulation
- Thermal and Reverse Polarity Protection

### AMPLIFIERS

- High efficiency Class D design(1D/2D/3D)
- Output stages utilize high-current MOSFET devices
- High speed, audio-grade components in all low-level stages
- Active Constant Current Bias Tracking Circuit
- Platinum-plated RCA inputs and connectors
- Wide range of sensitivity accepts signal from any head unit
- 24dB/octave Subsonic Crossover
- 24dB/octave Lowpass Crossover
- True Line Output
- Auto Bridge feature
- Short Circuit Protection

## INSTALLATION

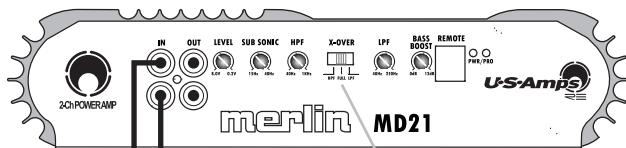
- Use at least 8-gauge wire for power and ground connections
- Use at least 12-gauge wire for speaker connections
- Use at least 16-gauge wire for remote connection
- Mount the amplifier where it can receive the best ventilation
- Use the shortest ground connection to the chassis of the vehicle and make sure that the paint is removed at the connection point
- Connect the remote input to the remote/antenna output of the head unit
- Mount the fuse holder within 200mm(8") of the vehicle's battery. Use a fuse equal to that specified for your amplifier if a large, single +12V line is run which feeds more than one amplifier add up all required fuse ratings and use the total rating for the fuse
- Connect the speaker to the amplifier observing the correct phasing. Make sure that none of the speaker connections can touch the vehicle chassis
- Connect the RCA inputs to the appropriate signal source using only the highest quality RCA cables
- Make sure that the RCA and speaker cables do not run parallel to the +12V wiring

# CONNECTIONS

## [Basic Wiring]

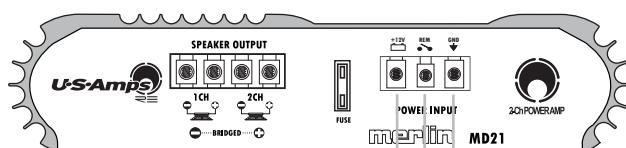
### ▲ 2-channel [MD21]

### and Monoblock [MD1D/2D/3D] Amplifiers



to OUTPUT of HEAD UNIT

in "FULL" position



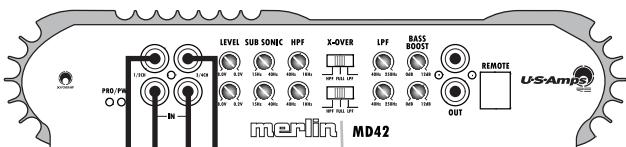
to BATTERY

GROUND

from REMOTE OUTPUT

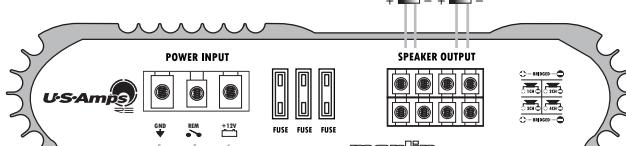
of HEAD UNIT

### ▲ 4-channel [MD42/43] Amplifiers



to OUTPUT of  
HEAD UNIT

Both in  
"FULL" position



to BATTERY

GROUND

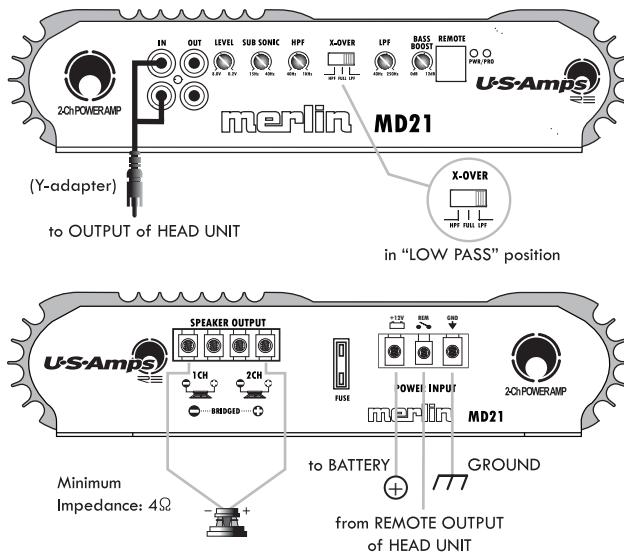
from REMOTE OUTPUT  
of HEAD UNIT

Impedance: 4~8Ω

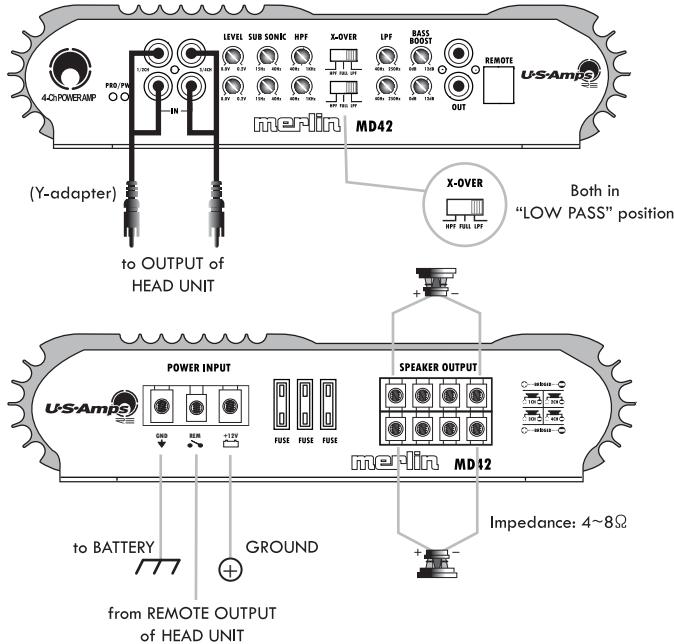
# CONNECTIONS

## [Bridged Wiring]

### ▲ 2-channel [MD21] Amplifier



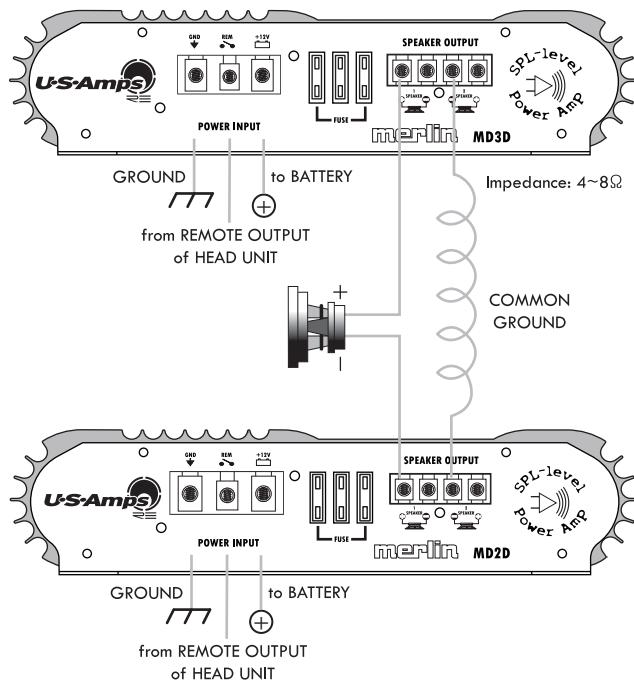
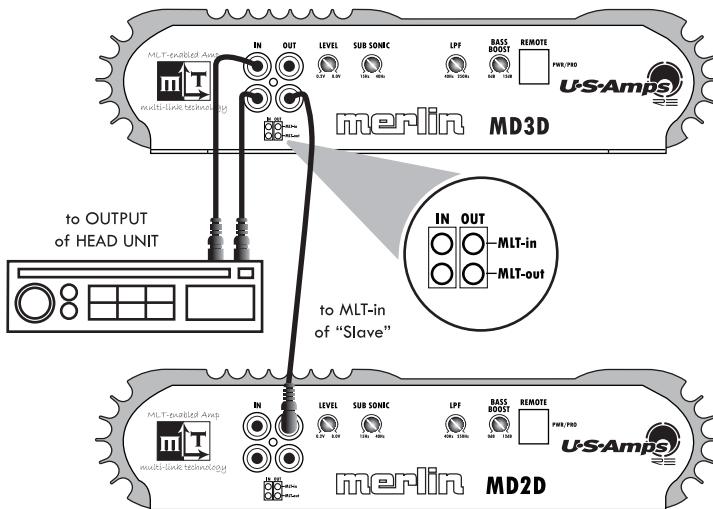
### ▲ 4-channel [MD42/43] Amplifiers



# CONNECTIONS

## [MLT Wiring] - Master/Slave

▲ for Monoblock [MD1D/2D/3D] Amplifier only



# SPECIFICATIONS

		MD21	MD42	MD43	MD1D	MD2D	MD3D
Power Output (RMS)	4Ω at full frequency	4Ω 2Ω	4Ω 1kHz 100Hz	4Ω 1kHz 100Hz	W W	2 x 75 2 x 100	4 x 75 4 x 90
	(10Hz~20kHz)	1Ω	100Hz	W			
	(before clipping)	4Ω mono	1kHz	W	1 x 200	2 x 180	2 x 300
Total Harmonic Distortion	4Ω	1kHz	%	0.03	0.03	0.09	0.09
S/N Ratio	Input Short	4Ω 1kHz	dB	105 95	100 83	80	80
Channel Separation @ 4Ω RMS					N/A	N/A	N/A
Frequency Response			Hz	10~30K	10~30K	20~250	20~250
Power Band Width (Frequency Response)		-1dB	Hz kHz	10 50	10 50	20~500	20~500
	Low Pass	24dB	Hz	40~250	40~250	40~250	40~250
Crossover Frequency	Subsonic	24dB	dB	15~40	15~40	15~40	15~40
	High Pass	12dB	Hz	•••	•••	40~1K	40~1K
Bass Boost Control @ 45Hz		dB	0~12	0~12	0~12	0~12	0~12
Wired Remote Control							
Bridged Mono Capable		Ω	4	4	4	•••	•••
Master Slave Capable			•••	•••	•••	Yes	Yes
Gain Control			Yes	Yes	Yes	Yes	Yes
Input Sensitivity	Low Level	1kHz	mV/V	200/8.0	200/8.0	200/8.0	200/8.0
	High Level	1kHz	V				
Input Impedance	Low	4Ω	600	400	400	100	100
	High	Ω					
Damping Factor							
Dimensions [(W) 2.5/63.5(H) x 10.5/280(D) in/mm]		in/mm	10.75/273	15.75/400	19.75/502	14.5/363	18.25/464
Fuse Rating		A	30A x 1	30A x 3	30A x 3	40A x 3	40A x 6
Protection (thermal, overload, short circuit, dc offset)			Yes	Yes	Yes	Yes	Yes
Power Voltage Range		V	12~16V	12~16V	12~16V	12~16V	12~16V



# TROUBLESHOOTING

**Before removing your amplifier, refer to the list below and follow the suggested procedures. Always test the speakers and their wires first.**

## No Output

- Confirm that all terminal strip connections are secure and tight.
- Check both in-line and built-in fuses.
- Confirm that the audio signal source (car radio, equalizer, etc) is connected and is supplying output signal. To check if the amplifier is supplying signal, unplug the RCA cables from the signal source (but leave them plugged into the amp) and briefly tap the center pin of each of the disconnected RCA plugs with your finger. This should produce a noise (feedback) in your speakers.

## Only one channel works

- Confirm that all terminal strip connections are secure and tight.
- Check the “BALANCE” control on the head unit (or other source) to verify that it is set to its mid point.
- If you are using the low-level RCA input, reverse the input plugs at the amplifier (switch the R with the L). If the channel which is silent switches to the other side, the problem is either in the head unit/other source or the connecting cables.

## Weak output

- Re-adjust the Input Level Control to better suit the input signal.

## Noise in the audio

- If the noise is a “whine” whose pitch follows the engine speed, confirm that the amplifier and any other signal sources (head unit, equalizer, etc) are properly grounded.
- If the noise is a “clicking” or “popping” noise whose rate follows the engine speed, this usually means that the vehicle is equipped with resistor spark plugs and wires, or that the ignition is in need of service.
- Check the routing of the speaker and input wires to make sure they are not adjacent to wires which interconnect with lights and other accessories.
- If the above steps fail to improve or clear noise interference, the system should be checked by a authorized **U.S.Amps** Dealer.

## Caution !

Jump starting your vehicle can cause large voltage spikes within your automobile's electrical system. To prevent damage to your stereo system, make sure the entire system is shut down until full battery charge has been reached and jumper cables have been removed from the battery.

## We want you listening for a lifetime!

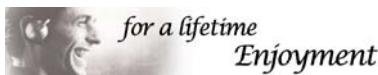
Used wisely, your new Merlin will provide a lifetime of fun and enjoyment. Since hearing damage from loud sound is often undetectable until it is too late, U.S. Amps and the Electronic Industry Association's Consumer Electronics Group recommend you avoid prolonged exposure to excessive loud sound.

dB level	Examples
30	Quiet library, soft whispers
40	Living room, refrigerator, away from traffic
50	Light traffic, normal conversation, quiet office
60	Air conditioner at 20 feet, sewing machine
70	Vacuum cleaner, hair dryer, noisy restaurant
80	Average city traffic, garbage disposal, alarm clock at 2 feet

## The following noises can be dangerous under constant exposure

90	Subway, motorcycle, truck traffic, lawn mower
100	Garbage truck, chain saw, pneumatic drill
120	Rock band concert in front of speakers, thunderclap
140	Gunshot blast, jet plane
180	Rocket launching pad

*Information courtesy of the Deafness Research Foundation*



for a lifetime  
Enjoyment

# MEMO

Model #:

Serial #:

Purchased Date:

Purchased From:

Write down key information of your Merlin amplifier(s) as noted above. Please refer this information when you need assistance from our technical support or RA service.

You can find important warranty information on the back cover.

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## **Limited Warranty:**

U.S.Amps warrants all manufactured electronic products to be free from defects in material and workmanship for a period not to exceed ONE YEAR from the date of purchase.

**IMPORTANT WARRANTY NOTICE:** U.S.Amps will only warrant and service products displaying valid U.S.Amps serial numbers. WARRANTY SERVICE WILL ONLY BE PERFORMED WHEN THE UNIT IS ACCCOMPANIED BY A COPY OF THE ORIGINAL SALES RECEIPT FROM AN AUTHORIZED DEALER. All product returned to U.S.Amps for service MUST be accompanied by a Return Authorization Number, issued by U.S.Amps in advance of shipment. The Return Authorization Number must be clearly and conspicuously displayed on the shipping carton or U.S.Amps will refuse delivery.

For Return Authorization Numbers, first call your U.S.Amps dealer you purchased the products from. The dealer will help you to obtain Return Authorization Numbers.

This warranty extends only to the original purchaser and is not transferable. Defective equipment must be returned within the warranty period, freight prepaid, to the U.S.Amps Factory or an Authorized U.S.Amps Warranty Station.

This warranty covers only defects in materials and workmanship of manufactured electronic products(amplifiers). Incidents of misuse, abuse, neglect, or unauthorized modification will not be covered within the terms of this warranty.

U.S.Amps reserves the right to refuse warranty service under such conditions.

U.S.AMPS WILL NOT BE RESPONSIBLE FOR ANY DAMAGES, WHETHER INCIDENTAL OR CONSEQUENTIAL, RELATED TO THE USE OF THIS OR ANY OTHER PRODUCT BEARING OR SOLD UNDER THE U.S.AMPS BRAND NAME. USE THIS PRODUCT AT YOUR OWN RISK. IMPROPER USE OF THIS PRODUCT CAN RESULT IN PROPERTY DAMAGE, BODILY HARM, AND OR OTHER DAMAGE. U.S.AMPS ASSUMES NO RESPONSIBILITY FOR YOUR HEALTH OR SAFETY.

